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Variation of surface wind speed with station
height above mean sea level - Central
and Northern England

1. Central England

A three-year average (1969-71) value for mean hourly wind speed was compared with height AMSL for 12 stations with open exposure and comparable anemometer effective height.

<u>Station</u>	<u>Height AMSL</u>	<u>Mean Wind</u>	<u>Estimated Mean Wind</u>
Finningley	19 m	8.0 kt	8.0 kt
Cottesmore	143	9.7	9.8
Elmdon	105	8.6	9.2
Brize Norton	91	8.1	9.0
Pershore	47	8.9	8.4
Fairford	78	8.1	8.8
Coltishall	29	8.0	8.1
Bedford	98	9.7	9.1
Wittering	83	9.0*	8.9
Honington	60	8.7*	8.6
Cranwell	76	9.2	8.8
Binbrook	118	10.3	9.4

*Estimated from incomplete data.

The correlation of wind speed and station height is 0.69 and the regression equation

$$W = 7.72 + 0.0144 H$$

where W = mean hourly wind speed
and H = station height AMSL.

gives a mean error (ignoring sign) of estimate of 0.4 kt.

2. Northern England

Averages of available data from 1967 to 71 for 5 low level stations were compared with wind speeds for Great Dun Fell.

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<u>Station</u>	<u>Height AMSL</u>	<u>Mean Wind</u>	<u>D_W/D_H</u>
Great Dun Fell	857 m	18.5	~~18.5~~
Durham	119	8.1	1.41
Leeming	42	8.5	1.23
Carlisle	41	8.8	1.19
Sellafield	25	8.7	1.18
South Shields	22	8.7	1.17

Where D_H = height difference from Great Dun Fell in 100's of metres

D_W = wind speed difference from Great Dun Fell.

The mean increase in wind speed is 1.24 kt per 100 metres and it is probable that the lower mean wind at Durham is due to a comparatively sheltered urban site.

Conclusion. The change of annual average surface wind speed with height of station AMSL is approximately $1\frac{1}{3}$ kt per 100 m in Central and Northern England.

Any comments or suggestions on this paper should be referred to the author.

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